PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Mauldin, Sidney Wayne
Application No.: 10/750,108
Filed: 12/31/03
For: Minimal Resistance Scallop for a Well Perforating Device

Group No.: 3672
Examiner: Frank Tsay

Board of Patent and Appeals and Interference
US Patent and Trademark Office
PO Box 1450
Alexandria, Virginia 22313-1450

APPEAL BRIEF

REAL PARTY IN INTEREST

The inventor is Sidney Wayne Mauldin, who is the owner of Specialty Welding, in Pampa, Texas, who specializes in making oilfield perforating guns that are sold to oilfield service companies.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service on this date February 8, 2008 in an envelope as "Express Mail Post Office Addressee," mailing Label Number EB 698749772 US, addressed to the: Board of Patent Appeals and Interference, US Patent and Trademark Office, PO Box 1450, Alexandria, Virginia 22313-1450.

Date: 02/08/2008

Brian E. Powley:

STATUS OF CLAIMS

The final office action rejected claims 1-14. Claims 1, 3, 5, 8, 10 and 12 were rejected under 35 U.S.C. 102(b) as being anticipated by Walker (US 6,497,285). Claims 2, 4, 6, 7, 9, 11, 13 and 14 were rejected under 35 U.S.C. 103(a) as being obvious in light of Walker US (6,497,285).

All of the claims 1-14 are pending and are being appealed.

STATUS OF AMENDMENTS

There have been no amendments filed subsequent to the final rejection.

SUMMARY OF INVENTION

The present invention is an improvement for a well perforating device and method of manufacture to make a modification to the industry standard method of cutting a scallop on the outer surface of the hollow steel carrier that contains the perforating charges. The scallops are made at the location of each charge to reduce the energy needed to exit the carrier. The present invention is the use of an arching geometric cut for the scallop. The thickness of the carrier at the location of the scallop can be reduced while maintaining sufficient structural strength to withstand the pressure exerted on the carrier, as a result of the additional strength imparted from the arched geometric cut. The deeper arching geometric shape reduces the thickness of steel that the perforating jet must penetrate to exit the carrier which increases the remaining energy for greater penetration and hole size. Increasing the depth of cut of the scallop alone to the same thickness would result in significantly reduced structural strength of the carrier and failure to withstand the external pressures exerted on the carrier. The additional smaller geometric

cut utilizes the additional strength created from the rigidity of the geometric cut to counter the effects of the reduced thickness.

ISSUES

I Are claims 1, 3, 5, 8, 10, and 12 of the present invention anticipated by Walker?

II Are claims 2, 4, 6, 7, 9, 13 and 14 of the present invention obvious in light of Walker?

GROUPING OF CLAIMS

The claims are grouped as the examiner grouped the claims in the Final Office Action.

ARGUMENT

ISSUE I

The Final Office Action indicates that Walker anticipates claims 1, 3, 5, 8, 10, and 12 of the present invention as Walker teaches that the thickness of the hole penetration area near the center of the recess is reduced resulting in a greater depth near the center of a conventional flat bottom recess due to the required pressure rating for the charge carrier.

The language cited by the examiner in column 3 of the Walker patent only refers to minimizing the hole size through the contoured bottom surfaces and preventing peeling of the recesses in the longitudinal direction. The language cited by the examiner in column 5 of the Walker patent does refer to the recess with a contoured bottom surface enhancing performance as the thickness of the steel at the center of the recess. Applicant concedes that the Walker patent indicates that reducing the thickness of steel at the center

of the recess results in enhanced performance as greater remaining energy is available to penetrate the formation.

The Walker patent has contoured hole penetration recesses with greater depth at the center of the recess, as compared to a conventional recess, to reduce the hole size made in the charge carrier upon detonation of the shaped charges thus enhancing debris containment in the wellbore. Another result of increasing the depth of the recess and reducing the thickness of the steel at the center of the recess is to allow greater penetration of the shaped charge into the formation as less energy is used to penetrate the carrier which is just an obvious result. Walker does not contend to be the inventor that reducing the thickness of steel will result in greater remaining energy to penetrate the formation. That is just an obvious result.

The present invention also does not contend to have invented the concept that reducing the thickness of the steel carrier at the center of the recess will result in greater remaining energy to penetrate the formation. The present invention does contend to have invented arched geometric inwardly shaped hole penetration areas to provide additional strength to the tubular body member. The purpose of the arched geometric recess is to allow the maximum amount of steel to be removed at the center of the recess to provide the maximum amount of remaining energy for penetration of the formation. The mere fact that more steel is also removed in the Walker patent, as compared to a conventional recess, does not anticipate the arched geometric recesses of the present invention to remove the maximum amount at the center for maximum formation penetration.

The arched geometric recesses of the present invention have nothing to do with the purpose of the Walker patent. The present invention would have more debris than the Walker design or a conventional recess. The present invention will crack and peel with the elliptical flat area causing it to peel. The present invention would be unacceptable in a low debris environment and would also be unacceptable in a high shot density as depicted in Figure 2 of the Walker patent. The Walker patent and the present invention have completely different purposes and the mere fact that both have less steel at the center of the recess resulting in greater penetration does not mean that Walker anticipates the present invention. Walker is to use contoured bottom surfaces to reduce hole size and the resulting debris. The present invention is the invention of arched geometric recesses to maximize the depth at the center of the recesses while maintaining integrity of the tubular member to maximize the depth of penetration into the formation.

ISSUE II

The Final Office Action indicates that the present invention does add the element of the hole penetration areas being elliptical in the remaining claims of 2, 4, 6, 77, 9, 13 and 14 but that these claims are unpatentable as they are obvious to a person of ordinary skill in the art. The Final Office Action indicates that this is attested by the inventor's own descriptions on page 12 where three different types of elliptical scallops shown in Figures 5, 6, 8 and 10 were tested to illustrate the relationship between tubular size and depth of the cut.

It is a circular argument to say that it is obvious to a person of ordinary skill in the art as the applicant is a person of ordinary skill in the art and the applicant tested the elliptical preferred embodiments. This circular argument could be said about any patent application.

Applicant is a person of skill in the art and has invented a highly desired new product that is sold to oilfield service companies that operate worldwide. One of such service companies is Halliburton, who is the assignee of the Walker patent, and has used the present invention extensively in many locations with no complaints of patent infringement.

The elliptical shape is necessary to compensate for tolerances in the tubular body length and carrier length, which can combine up to a quarter inch, to maintain the charge within the elliptical flat for the least possible amount of resistance.

APPENDIX

The claims being appealed are as follows:

What is claimed is:

1. A well perforating device comprising a tubular body member having a plurality of inwardly shaped hole penetration areas of reduced thickness formed on the outer surface thereof, and a plurality of perforating charges positioned within said body member, each of said perforating charges containing a hollow cone shaped explosive charge aligned with one of said hole penetration areas so that upon detonation of the hollow cone shaped charge said body member is penetrated through said aligned hole penetration areas, an improvement comprising;

an arched geometric shape in said inwardly shaped hole penetration areas which provides additional strength to said tubular body member so that the thickness of said body member at the location of said inwardly shaped hole penetration can be further reduced minimizing the resistance to said perforating charges while still retaining sufficient structural strength to withstand pressures exerted on said body member.

2. The perforating device of claim **1** wherein said plurality of inwardly shaped hole penetration areas have an elliptical shape.

3. The perforating device of claim **1** wherein said plurality of inwardly shaped hole penetration areas have a radius shape.

4. The perforating device of claim **3** wherein said plurality of inwardly shaped hole penetration areas are made longer longitudinally so that said hole penetration areas have an elliptical shape.

5. The perforating device of claim **1** wherein said plurality of inwardly shaped hole penetration areas have a radius shape with a longitudinal flat area where the thickness of said body member is reduced the most.

6. The perforating device of claim **5** wherein said longitudinal flat area makes said plurality of inwardly shaped hole penetration areas to have an elliptical shape.

7. The perforating device of claim **1** wherein said plurality of inwardly shaped hole penetration areas has an industry standard elliptical shape with an additional longitudinal arched shape so that a flat area is formed at the center of said hole penetration area where the thickness of said body member is reduced the most.

8. A well perforating device comprising a tubular body member having at least one hole penetration area of reduced thickness formed in the outer surface thereof, and a perforating charge positioned within said body member, said perforating charge containing a hollow cone shaped explosive charge aligned with one of said hole penetration areas so that upon detonation of the hollow cone shaped charge said body member is penetrated through said aligned hole penetration area, an improvement comprising;

an arched geometric shape for said hole penetration area of reduced thickness as a means to provide additional structural strength to further reduce the thickness while retaining sufficient strength to withstand pressures exerted on said body member.

9. The perforating device of claim **8** wherein said hole penetration area has an elliptical shape.

10. The perforating device of claim **8** wherein said hole penetration area has a radius shape.

11. The perforating device of claim **10** wherein said hole penetration area is made longer longitudinally so that said hole penetration area has an elliptical shape.

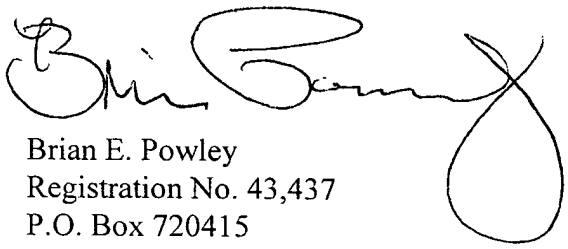
12. The perforating device of claim **8** wherein said hole penetration area has a radius shape with a longitudinal flat area where the thickness of said boy member is reduced the most.

13. The perforating device of claim **12** wherein said longitudinal flat area makes said hole penetration area to have an elliptical shape.

14. The perforating device of claim **8** wherein said hole penetration area has an industry standard elliptical shape with an additional longitudinal arched shape so that a flat area is formed at the center of said hole penetration area where the thickness of said body member is reduced the most.

The Applicant respectfully requests that this appeal be granted.

Respectfully submitted,



Brian E. Powley
Registration No. 43,437
P.O. Box 720415
Oklahoma City, OK 73172-0415

Attorney for Applicant